

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method, comprising the computer-implemented steps of:
receiving, at a single console control point for a network device cluster, user input
specifying an operation to be performed concurrently on all active routers in a
plurality of active routers as a whole and only on the plurality of active routers;
automatically and concurrently performing the specified operation only on all the active
routers in the plurality of active routers in the network device cluster by
transforming the specified operation into one or more device-specific operations
for each of the active routers in the plurality of active routers;
wherein the user input specifies a configuration command for the network device cluster;
automatically and concurrently communicating the configuration command to each of the
active routers in the plurality of active routers;
wherein the network device cluster comprises a first switch device, the plurality of active
routers, one or more standby routers, and a second switch device;
wherein the first and second switch devices are associated with different networks;
concurrently reconfiguring each of the active routers in the plurality of active routers in
the network device cluster[[,]] based on reconfiguration information;
wherein the reconfiguring causes a change of one or more connections between the active
routers in the plurality of active ~~router~~ routers and the switch devices.
2. (Cancelled)
3. (Previously Presented) The method as recited in Claim 1, further comprising the steps of:
subscribing a management process to an event bus;
subscribing each of the active routers to the event bus; and
publishing the configuration command in an event on the event bus.

4. (Previously Presented) The method as recited in Claim 3, further comprising the steps performed at each of the active routers of:
 - receiving the event;
 - extracting the configuration command from the event; and
 - presenting the configuration command to a native console.
5. (Previously Presented) The method as recited in Claim 1, wherein the configuration command is a configuration load command.
6. (Previously Presented) The method as recited in Claim 1, wherein the configuration command is a configuration execution command.
7. (Previously Presented) The method as recited in Claim 1, wherein the user input is received in a graphical user interface, and further comprising the step of displaying an execution log for the configuration command within the same graphical user interface in which the user input is received.
8. (Currently Amended) The method of claim 1, further comprising:
 - receiving, at a single console control point for ~~a~~ the network device cluster, first user input requesting an operational overview of the cluster; and
 - generating and displaying an operational overview of the cluster, wherein the operational overview comprises a status indicator, connection information, failed device information, and a first access icon for accessing information about ~~the~~ a stack; wherein the network device cluster further comprises ~~a first switch device, a~~ the stack consisting of one or more active routers and one or more standby routers, ~~and a second switch device.~~
9. (Previously Presented) The method as recited in Claim 8, further comprising the steps of:
 - receiving second user input that selects the first access icon;

generating and displaying a device operational overview for devices in the cluster,
wherein the device operational overview comprises, for each router in the stack of the cluster, a device status indicator, device connection information unique for each router within the cluster, failed connection information, and a second access icon for accessing information about connections of the first and second switch devices and the stack.

10. (Previously Presented) The method as recited in Claim 9, further comprising the steps of:
receiving third user input that selects the second access icon;
generating and displaying a connection operational overview for connections of the cluster, wherein the connection operational overview comprises, for each connection of the stack, a connection status indicator and one or more values of attributes associated with the connection.
11. (Previously Presented) The method of claim 1, further comprising:
receiving first user input in a user interface (UI) at a single console control point for the network device cluster that identifies the first switch device and the second switch device for the cluster;
receiving second user input in the UI that identifies a plurality of network elements for a router stack of the cluster;
receiving third user input in the UI that defines at least one first connection of the first switch device in association with at least one network element in the stack, and at least one second connection of the second switch device in association with the at least one network element in the stack; and
associating the first, second, and third user input in a cluster object that programmatically represents the cluster.

12. (Previously Presented) The method as recited in Claim 11, further comprising the steps of:

receiving information specifying that a network element in the cluster has failed;
based on the cluster object, selecting a substitute network element from among one or more available network elements from the router stack;
receiving connection configuration information from the identified network element; and
based on the connection configuration information, re-configuring the substitute network element and the first and second switch devices associated with the identified network element, wherein the re-configuring causes the first and second switch devices to change one or more connections from the identified network element to the substitute network element.

13. (Previously Presented) The method as recited in Claim 12, wherein the step of re-configuring the substitute network element and the one or more switch devices associated with the identified network element further comprises the steps of:

creating one or more sets of commands to configure the first and second switch devices;
and
publishing a configuration load event that includes the commands and that targets only the first and second switch devices associated with the identified and substitute network elements.

14. (Previously Presented) The method as recited in Claim 13, wherein the step of re-configuring the substitute network element and the first and second switch devices associated with the identified network element further comprises the steps of:

in response to the configuration load event, each of the first and second switch devices connecting to a cluster manager and receiving a particular set of commands;
at the first and second switch devices, processing the particular set of commands, wherein processing includes causing the first and second switch devices to change the one

or more connections from the identified network element to the substitute network element; and

at each of the first and second switch devices, publishing a configuration complete event to acknowledge completing the processing of the particular set of commands.

15. (Previously Presented) The method as recited in Claim 11, wherein the third user input includes information defining a set of commands used to reconfigure at least one switch device.

16. (Previously Presented) The method as recited in Claim 11, wherein the first, second and third user inputs are stored persistently at a cluster manager; and wherein each of the switch devices and the plurality of network elements persistently stores startup configuration information, but does not store the first, second and third user inputs.

17. (Previously Presented) The method as recited in Claim 11, wherein the second user input comprises information identifying one or more network elements from the plurality of network elements as back-up network elements.

18. (Previously Presented) The method as recited in Claim 11, wherein the second user input comprises information identifying one or more network elements from the plurality of network elements as stand-by network elements.

19. (Previously Presented) The method as recited in Claim 11, further comprising the step of receiving a fourth user input in the UI that modifies information received in the second and third user inputs.

20. (Previously Presented) The method as recited in Claim 11, further comprising the step of receiving a fourth user input in the UI that identifies the at least one network element as removed from the plurality of network elements.

21. (Previously Presented) The method as recited in Claim 11, further comprising the step of receiving a fourth user input in the UI that disassociates at least one switch device with at least one network element from the plurality of network elements.

22. (Previously Presented) The method as recited in Claim 11, wherein the first, second, and third user inputs define a logical stack object, wherein the logical stack object is identified by a stack name and represents a logical grouping of at least two switch devices and at least one network element.

23. (Previously Presented) The method as recited in Claim 22, further comprising the step of receiving a fourth user input in the UI that requests sending a command to all switch devices and all network elements represented by the logical stack object.

24. – 25. (Cancelled)

26. (Currently Amended) An apparatus comprising:

one or more processors;

means for receiving user input at a single console control point for a network device

cluster, the user input specifying an operation to be performed concurrently on all active routers in a plurality of active routers as a whole and only on the plurality of active routers;

means for automatically and concurrently performing the specified operation only on all the active routers in the plurality of the active routers in the network device

cluster by transforming the specified operation into one or more device-specific operations for each of the active routers in the plurality active routers;

means for automatically and concurrently communicating the configuration command to each of the active routers in the plurality of active routers;

wherein the network device cluster comprises a first switch device, the plurality of active routers, one or more standby routers, and a second switch device;

wherein the first and second switch devices are associated with different networks;
means for concurrently reconfiguring each of the active routers in the plurality of active
routers in the network device cluster[[,]] based on reconfiguration information;
wherein the reconfiguring causes a change of one or more connections between the active
routers in the plurality of active ~~router~~ routers and the switch devices.

27. (Previously Presented) The apparatus of Claim 26, wherein the receiving step comprises receiving user input specifying a configuration command for the cluster; and wherein the performing step comprises automatically communicating the configuration command to each of the active routers in the plurality of active routers.

28. (Previously Presented) The apparatus of Claim 27, further comprising:
means for subscribing a management process to an event bus;
means for subscribing each of the active routers to the event bus; and
means for publishing the configuration command in an event on the event bus.

29. (Previously Presented) The apparatus of Claim 28, further comprising:
means for receiving the event;
means for extracting the configuration command from the event; and
means for presenting the configuration command to a native console.

30. (Previously Presented) The apparatus of Claim 27, wherein the configuration command is a configuration load command.

31. (Previously Presented) The apparatus of Claim 27, wherein the configuration command is a configuration execution command.

32. (Previously Presented) The apparatus of Claim 27, wherein the user input is received in a graphical user interface, and further comprising means for displaying an execution log for the

configuration command within the same graphical user interface in which the user input is received.

33. – 35. (Cancelled)